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ABSTRACT

A study was done of student achievement and its relation to family and community poverty in light of 20 years of education reform and Chapter 1 funding since 1966. The study used the following three long-term studies of American high school students, in which measures of achievement and socioeconomic standing are meant to be comparable among different cohorts of students: (1) the National Longitudinal Study of the High School Class of 1972, which measured data for approximately 19,000 high school students; (2) the High School and Beyond Study, which measured the sophomore and senior classes of 1980 and included approximately 58,000 students; and (3) the National Education Longitudinal Survey of 1988, which measured approximately 25,000 students. The results indicate that the most potent factors in student achievement in 1972 in reading were level of parents' education, time spent on homework, non-minority racial status, and parental income. In 1988, the most potent factors were parents' educational level, non-minority status, family income, time spent on homework, and being female. For mathematics achievement, the most important factors in 1972 included non-minority status, being male, parental education, time spent on homework, and parental income. In 1988, they included parental education, non-minority status, family income, and time spent on homework. The only factor that seemed to change in importance was gender, although this finding may be due to the different ages tested. Included are 1 table and 10 references. (JB)

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and

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Introduction[1]

Education has traditionally been seen as a function of state and local governments, since it is not mentioned in the U.S. Constitution. For this reason, federal concern with education has been limited to national political priorities. In the early 1960's, the economic and social effects of poverty in many areas of the country began to be of federal concern. President Kennedy first proposed federal aid to education as a means of combatting poverty; after his assassination, Lyndon Johnson added substantially to the original proposal. In Johnson's view, borne out by his own experiences, greater educational opportunity for poor children would increase their employment opportunities once they finished school. In this way, poverty would be eliminated. Title I of the Elementary and Secondary Education Act [ESEA] of 1965 (now Chapter 1 of the Educational Consolidation and Improvement Act [ECIA] of 1981) was the centerpiece of legislation designed to accomplish these goals. President Johnson declared, in introducing it to Congress: "I propose that we declare a national goal of full equality of educational opportunity (Message on Education speech, U.S. House, 1965a, p. 1)." The major target was to be "the impact of poverty and deprivation upon youngsters in the low-standard school districts of the country and in rural and urban slums" (Senator Wayne Morse, as quoted in Bailey and Mosher, p. 27). Title I directed money at counties in direct proportion to the number of poor children who resided there.

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The authors of Title I thought that additional money would directly improve educational programs, and hence attainment. Since the amount of money received was intended to be directly proportional to the number of low-income children, poor districts would receive Chapter 1 money in direct proportion to the level of poverty. Since poverty and achievement were closely related, then, districts would receive money in proportion to their educational needs as well. Districts would then translate these funds into higher achievement levels for the affected students. Therefore, the amount of money appropriated was substantial--$1.4 billion dollars in 1966.

Twenty-five years later, Title I, now Chapter 1 of the Educational Consolidation and Improvement Act of 1981, is the largest federal program of aid to local school districts. Ninety percent of all school districts receive Chapter 1 money, and the program continues with only minor modifications since the late 1960's. The money is spent on remedial math, reading, and writing programs in most districts.

Many districts add local and/or state funds to the federal monies received: in 1984-85, 16 states had compensatory education programs (Birman, p. 18-19). Some of these follow guidelines similar to Chapter 1; others, such as New York's PSEN [Pupils with Special Educational Needs] use other criteria for aid, such as scores on achievement tests. In some places, but not all, local and state monies are used to expand programs so that all students in need of remediation can participate, regardless of family income level.

In addition to Chapter 1, other federal and state initiatives have attempted to raise funds and student achievement since the 1960's, with awards based on educational need. Some legislation has been aimed at rectifying past discriminatory practices in education, such as racial segregation and sex

discrimination, which had reduced educational opportunities for certain groups such as minorities and females. Need criteria include having large numbers of non-English speaking children, children with learning disabilities, or physical handicaps, etc., as well as community or family poverty. Federal legislation has provided bilingual education aid, Headstart, and aid for the education of the handicapped and disabled. It has also promoted equal funding for boys' and girls' programs and elimination of racially segregated schools., awarding funds on the basis of educational need. Similar state programs exist all over the country, as well, increasing funding for these programs above that provided by the federal government and local districts.

Many states now also include a provision for students with special needs in calculating foundation and other school aid to local educational agencies (LEAs), as well. For example, California calculates a measure of relative need, based on the amount of non-English speaking children, children needing special education because of handicaps or learning disabilities, community poverty, etc., which is then used in the state aid formula used to determine allocations.

In addition, local districts also often raise extra money for programs intended to raise achievement among the poor and disadvantaged. Different schools and/or programs receive funding according to their perceived need.

All these changes have attempted to improve achievement among children of the poor, and attempted to decouple low achievement from low socioeconomic status and poorly-funded school districts in poor areas. However, in the twenty-five years since Title I was first passed, there has been much controversy about what are the most effective programs, which are most cost-efficient, and whether increased funding has hit its targets. For example, in

most school districts, the amount of money provided by Chapter 1 amounts to a marginal sum--1 to 7% of their budgets. For some, the program's regulations require expenditures in excess of allocations. Although the formula appears to provide that benefits accrue to districts in direct proportion to the level of poverty in the district, districts with the same number of low-income children do not necessarily receive the same amount of Chapter 1 funds if they lie in different states or counties (Drazen, 1991). The use of state average per pupil educational spending as a cost factor in the federal Chapter 1 formula was intended to assure that amounts were comparable; i.e. higher costs in New York meant higher allocations per child. However, the accuracy of using average expenditures in measuring either educational costs or cost of living is questionable: For instance, the cost of education in New York City is two to three times that found upstate (Nelson, 1991), but all districts in the state receive roughly the same amount per low-income student. This situation means that New York City may not receive enough money to serve students at the same levels as other districts upstate. Similarly, Vermont lies next to upstate New York; it is reasonable to assume that education costs would be similar in rural Vermont as in rural upstate New York. However, Vermont receives much less money per low-income student because of the state's lower educational spending. Similar potentially problematical examples may be found all over the country.

Other questions about targeting remain. Goertz's (1988) study of Chapter 1 found that services were distributed among schools in most districts randomly with respect to poverty, achievement, and the concentration of Chapter 1 students within individual schools. Other authors have charged that

the majority of children served under Chapter 1 are not poor (see Drazen, 1991, for a review).

State programs are also often criticized for inadequate equalization of funding between rich and poor districts, giving rise to numerous lawsuits. Some states have attempted to address this problem either by legislation, as in Kentucky, or have been ordered to by court action. Still others, such as Florida and Hawaii, have moved to fully fund all districts, with no local discretion. The Florida and Hawaii programs have met with severe criticisms that only a very minimal standard is being met, and that districts desiring programs at a higher level can not tax themselves to provide them.

In most other places, relatively wealthy districts and states can afford to augment programs much more than the poorest ones. Tax levies are often lower in wealthier districts, as greater property wealth brings in high revenues, even when taxed at a relatively low rate. The experience of many states with tax limitation measures, such as California and Massachusetts, has been that poor districts suffer disproportionately high levels of funding cuts, as wealthier districts do not need high tax rates, or can afford yearly campaigns to override these limitations. In fact, in Massachusetts, the wealthy town of Lexington had to raise their tax rate to comply with the law, although the school system there had already been considered excellent. Foundation grants rewarding "effort", or tax rate, often disfavor extremely poor districts with the lowest tax rates.

Evaluations of the success of the various state and federal initiatives in raising student achievement in poor areas have been equivocal. (See Drazen, 1991, for a review of these reports on Chapter 1.) Small average gains in achievement and/or IQ for several years following the program have

been reported, but relatively few long-term studies have been done. Headstart has been the only program of its kind intensively studied on a long-term basis. Large, long-term studies have shown continued effects on participants twenty years later, as measured by employment records and school attendance, retention, and achievement (Lazar, Darlington, et. al., 1982). Initial study findings, however, showed only small gains in IQ which disappeared in two or three years, and probably caused the failure of efforts to expand Headstart to all eligible children in the early 1970's. Unfortunately, no comparable work has been done on Title I/Chapter 1 or any of the other initiatives described above.

In addition, most of these programs have been categorical, directly funding only relatively small numbers of students in most districts. Many programs have different eligibility requirements, and there is little coordination between them, leading to a crazy-quilt of regulations and bureaucracy. Many children fall through the cracks, or are serviced for only a few years. Therefore, there has been concern as to whether the majority of students and the overall level of student achievement has been affected. Declining average scores on the SAT's and other standardized tests over the last twenty years have fueled a debate as to whether these programs have had much effect on patterns of achievement at all.

Questions

We are still left with the question, "Has there been any change in the relationship between family and community poverty to low student achievement

as a result of changing patterns of educational curricula and funding?" Karl White (1982), in a meta-analysis of 19 studies, found a correlation of .315 between family income and student achievement, and .185 between parental education and student achievement, using 116 studies. These figures are similar to James S. Coleman's results in 1966. However, all these studies used differing measures of income and achievement, and so the statistics obtained are not necessarily comparable. There have been no large studies examining change in the overall student population using comparable measures. The present study attempts to address this problem by using the U.S. Department of Education's long term studies of American high school students, in which measures of achievement and SES are meant to be comparable among different cohorts of students.

These relationships among elementary school students have been explored by the National Assessment of Educational Progress [NAEP] testing series. However, the use of spiraling techniques for testing achievement, whereby each student is only given a relatively small number of questions, and then all their results are pooled, is statistically less robust than the high school studies, and so were not used in this analysis.

Methods

The National Longitudinal Studies [NELS] program of the Department of Education's Center for Statistics has compiled three longitudinal studies which are meant to be comparable in all their measures, and representative of the country as a whole. Each study includes measures of achievement using

tests made up for the study, and measures of family and community income. The first was the National Longitudinal Study of the High School Class of 1972 [NLS-72], which measured data from approximately 19,000 high school seniors. The second was High School and Beyond, which measured the sophomore and senior classes of 1980, included about 58,000 students. The first follow-up was in 1982, when the 1980 sophomores were seniors. The most recent study, the National Educational Longitudinal Survey of 1988 [NELS-88], measured about 25,000 students who were in 8th grade in 1988, and will have follow-ups in 1990 and 1992, when they are sophomores and seniors, respectively. The present study uses these data to compare statistics on these associations over the past twenty years to determine changes.

The statistical program SAS was used for calculations, and all correlations were weighted by student sample weight according to instructions accompanying the dataset.

Results and Discussion

The preliminary results comparing the NLS-72 data, HSB, and NELS-88 data is shown in Table 1. Coleman's (1966) results, as reported by White (1982), as well as White's results from his meta-analysis of studies done between 1918 and 1977, are included, but may not be comparable because of different measures used. Table 1 shows that associations between reading and math scores with SES, parental education, family income, and percentage of minority and disadvantaged children in the school increased slightly between 1972 and 1988, particularly when comparing students in the same grade (12).

Correlations between achievement and family income dipped slightly in the early 1980's, rising in the 1988 study. Community income was not available on the 1988 study, but dipped through the early 1980's, according to Table 1. Time spent on homework showed stronger correlations in the early 1980's, but dropped considerably in the 1988 study. However, this may be due to the different grade level measured. The first follow-up of NELS-88, done in 1990, is due to be released soon, and will contain comparable measures to the sophomore sample from 1980.

Unfortunately, detailed measures of school resources were not available in the 1972 study, and differing measures were used in HSB and NELS-88. No allowances for differing costs in different regions are included with these databases. A more complex analysis will be attempted in the future on these data.

Table 1
Weighted Correlations

Study:	Coleman		White	NLS-72	HSB	HSB	HSB	NELS-88
Year:	1966		1918-77	1972	1980	1980	1982	1988
Grade of student:	9	12	all	12	10	12	12	8
Family measures:								
SES[1]:								
Reading	.176	.175			.348	.337	.355	.404
Math	.161	.131			.373	.376	.380	.442
Combined	.168	.153	.318		.431	.412	.451	.458
Family income:								
Reading				.269	.217	.212	.242	.323
Math				.298	.249	.263	.266	.365
Combined			.315	.334	.286	.269	.297	.373
Father's education:								
Reading				.272	.287	.278	.306	.324
Math				.280	.322	.299	.351	.372
Combined			.185	.331	.359	.336	.374	.376
Mother's education:								
Reading				.234	.259	.230	.263	.278
Math				.243	.267	.252	.295	.308
Combined				.288	.309	.280	.324	.318
School and community factors:								
Community income[2]:								
Reading				.156	.076	.116	.091	
Math				.152	.137	.150	.145	
Combined				.193	.136	.153	.139	
Percent disadvantaged in school[3]:								
Reading				-.183				-.249
Math				-.201				-.281
Combined				-.231				-.288
Percent African-American students in school:								
Reading				-.186	-.206	-.193	-.223	-.225
Math				-.197	-.236	-.206	-.239	-.243
Combined				-.225	-.271	-.237	-.281	-.254
School resources: Combined			.619					
Individual factors:								
Time spent on homework:								
Reading				.172	.247	.229	.256	.169
Math				.195	.294	.276	.275	.196
Combined				.201	.300	.274	.292	.197

Note: All correlations significant at the .0001 level. Achievement scores scaled 0-100.

1. All SES measures include parental income, education, and occupation. Coleman's SES, as published by White (1982), also measured family size and structural integrity and family possessions. White's measure includes only the first three factors mentioned above in a meta-analysis of 27 studies. The NLS series measures include the first three factors and family possessions.

2. Community income in the NLS-72 was measured by income in the school attendance area. HSB used census measures of county income for 1980 and 1981.

3. Percentage of disadvantaged measured by state or federal guidelines for NLS-72 and HSB. Free lunch counts were used in NELS-88.

Preliminary regression analyses of scores using the factors of parental educational level, minority status, sex, family income, time spent on homework, percentage of minority and disadvantaged students, enrollment, and urbanicity of the school showed that the most potent factors in student achievement in reading were level of parents' education, time spent on homework, non-minority racial status, and parental income in 1972; in 1988, the most potent factors were parents' educational level, non-minority status, family income, time spent on homework, and being female.

For math achievement, the most important factors in 1972 included non-minority status, being male, parental education, time spent on homework, and parental income. In 1988, they included parental education, non-minority status, family income, and time spent on homework.

These results indicate that the only factor which seemed to change in importance was that of sex, since being female was a non-significant factor in reading and a significant negative factor in math achievement in 1972. In 1988, being female was a significant positive factor in reading achievement, and was non-significant in math. However, this difference may also be due to the differing ages tested in these two samples. The results of the two classes in HSB, as well as the 1990 and 1992 NELS-88 data support this conclusion.

Conclusions

This study is still in its preliminary stages. The data analyzed so far indicate that the factors of parental educational level, family income, time spent on homework, and percentage of disadvantaged and minority students continue to have similar associations with reading and math achievement as those of 20 years ago. However, the differing ages of the samples at the time

of testing--seniors in NLS-72, 10th and 12th graders in HSB, and 8th graders in NELS-88--need to be compared with the two follow-ups to be released on NELS-88. As well, the relationships between these variables and the distributions of scores also need to be compared to obtain a more complete picture of the history of changes of these associations.

The lack of change in the influence of these factors may be due to several factors. One possibility is that the fragmented, disorganized approach toward improvement of the achievement of poor children which has been attempted in this country in the last twenty-five years has produced some success stories in particular places and programs, but not the overall change hoped for. A combined program of health care, parental education and support programs, and better school resources might have had a greater influence on overall achievement. To test this possibility, comparisons with other countries which have had comprehensive programs for many years will be necessary, but are not easily accomplished, given linguistic and schooling differences.

A second possibility does not necessarily imply that programs in the U.S. for disadvantaged children has not worked. On the contrary, it is important to consider what would have happened without that aid. In the last 20 years, the costs of materials, teachers, and technology have risen greatly above the rate of inflation. Without aid to poor districts, family and school characteristics may have become much more associated with achievement outcomes, as school district quality became more tied to the community's ability to support it.

Another possibility is that federal and state aid, although aimed at poor areas, is not actually being correctly targeted, and middle-class areas are benefitting disproportionately from this type of aid. This result has been demonstrated in the case of Chapter 1 (Drazen, 1991). Other programs may be equally vulnerable to this type of misdirection of funds.

Unfortunately, these possibilities will be nearly impossible to test. Very little school finance data has been collected in these studies, as mentioned above, and differing measures on each database hinder analysis, giving little opportunity to study change in this area and how it relates to student achievement. Even state agencies have little data allowing this type of analysis. Possibilities for resolving this question will be explored with state and local agencies as much as possible.

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